What is claimed is:

1. A spectroscope comprising:

an entrance aperture member for passing a light;

a first optical system which collimates a dispersing light which is emitted from the entrance aperture member into an approximate collimated light flux;

a dispersing element which is disposed so as to freely rotate for dispersing the approximate collimated light flux;

a second optical system for condensing the light flux which is dispersed by the dispersing element near a focal plane;

a variable-width slit having a variable slit-width which is disposed near the focal plane; and

an optical detector for detecting a light flux which passes the variable-width slit among the dispersed light flux according to the slit-width of the variable-width slit or the rotation of the dispersing element.

2. A spectroscope according to Claim 1 wherein aberrations for a plurality of wavelengths of an off-axial light flux are compensated in the second optical system.

3. A spectroscope according to Claim 2 wherein the second optical system comprises a plurality of lenses.

4. A spectroscope according to Claim 2 wherein:

the second optical system comprises at least a lens having a positive focal length and at least a lens having a negative focal length; and

a relationship such as $v_+ - v_- > 25$ is effective under condition that v_+ indicates an

Abbe number for the lens having a positive focal length and v_- indicates an Abbe number

for the lens having a negative focal length.

5   5.   A spectroscope according to Claim 4 wherein the dispersing element is a reflective

plane grating satisfies a relationship such as

$$0 < \frac{2.44\cos\alpha}{NmD} < 0.04$$

under condition that a indicates an incident angle of a light flux which is incident to the

reflective plane grating, N indicates grooves per a unit length of the reflective plane

10   grating, m indicates a diffraction order, and D indicates a diameter of the light flux which

passes through the first optical system.

6.   A spectroscope according to Claim 5 wherein the first optical system comprises a

first lens group having a negative focal length and a second lens group having a positive

15   focal length.

7.   A spectroscope according to Claim 2 wherein:

the dispersing element is a reflective plane grating;

the optical detector detects a light flux having a desirable wavelength selectively

20   by rotating the reflective plane grating and changing the width of the slit of the

variable-width slit.

8.   A spectroscope according to Claim 2 wherein the optical detector detects a light flux

having a desirable wavelength selectively by changing the slit width of the

variable-width slit under condition that a prism is used for a fixed dispersing element.

9. A laser scanning microscope comprising:

a light source;

5 an objective lens which condenses a light which is emitted from the light source

on a sample;

a light condensing optical system which condenses a light which is reflected by

the sample or a light which is emitted from the sample;

an aperture member which is disposed at a focal point in the light condensing

10 optical system so as to be optically conjugate with the sample;

a first optical system which collimates the dispersed light which is emitted from

the aperture member into an approximate parallel light;

a dispersing element which is disposed so as to freely rotate for dispersing the

approximate parallel light flux;

15 a second optical system which condenses the light flux which is dispersed by the

dispersing element near the focal plane;

a variable-width slit which is disposed near the focal plane of which slit width is

variable; and

an optical detector which detects the light flux which passes through the

20 variable-width slit among the dispersed light fluxes according to the width of the slit or

the rotation of the dispersing element.

10. A laser scanning microscope according to Claim 9 wherein the aperture member

has an aperture which is formed as a pinhole.

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11. A laser scanning microscope according to Claim 10 wherein aberrations for a plurality of wavelengths of an off-axial light flux are compensated in the second optical system.

5   12. A laser scanning microscope according to Claim 12 wherein the second optical system comprises a plurality of lenses.

13. A laser scanning microscope according to Claim 12 wherein:

the second optical system comprises at least a lens having a positive focal length

10   and at least a lens having a negative focal length; and

a relationship such as $v_+ - v_- > 25$ is effective under condition that v_+ indicates an Abbe number for the lens having a positive focal length and v_- indicates an Abbe number for the lens having a negative focal length.

15   14. A laser scanning microscope according to Claim 13 wherein the dispersing element is a reflective plane grating satisfies a relationship such as

$$0 < \frac{2.44\cos\alpha}{NmD} < 0.04$$

under condition that a indicates an incident angle of a light flux which is incident to the reflective plane grating, N indicates grooves per a unit length of the reflective plane

20   grating, m indicates a diffraction order, and D indicates a diameter of the light flux which passes through the first optical system.

15. A laser scanning microscope according to Claim 14 wherein the first optical system comprises a first lens group having a negative focal length and a second lens group

having a positive focal length.

16.   A laser scanning microscope according to Claim 11 wherein:

the dispersing element is a reflective plane grating;

the optical detector detects a light flux having a desirable wavelength selectively

by rotating the reflective plane grating and changing the width of the slit of the

variable-width slit.

17.   A laser scanning microscope according to Claim 11 wherein the optical detector

detects a light flux having a desirable wavelength selectively by changing the slit width

of the variable-width slit under condition that a prism is used for a fixed dispersing

element.

18.   A laser scanning microscope according to Claim 11 wherein:

a single mode fiber is disposed so as to have an incident end of the single mode

fiber is disposed instead of the aperture member.

19.   A confocal optical system comprising:

a light source;

an objective lens which condenses a light which is emitted from the light source

on a sample;

a light condensing optical system which condenses a light which is reflected by

the sample or a light which is emitted from the sample;

an aperture member which is disposed at a focal point in the light condensing

optical system so as to be optically conjugate with the sample;

a first optical system which collimates the dispersed light which is emitted from the aperture member into an approximate parallel light;

a dispersing element which is disposed so as to freely rotate for dispersing the approximate parallel light flux;

5   a second optical system which condenses the light flux which is dispersed by the dispersing element near the focal plane;

a variable-width slit which is disposed near the focal plane of which slit width is variable; and

an optical detector which detects the light flux which passes through the

10   variable-width slit among the dispersed light fluxes according to the width of the slit or the rotation of the dispersing element.

20.   A laser scanning microscope according to Claim 9 wherein a relationship such as $\Delta\lambda < 20$ nm is effective under condition that $\Delta\lambda$ indicates a wavelength resolution for

15   separating a light having a wavelength λ from a light having a wavelength $(\lambda+\Delta\lambda)$.

21.   A laser scanning microscope according to Claim 9 wherein a relationship such as $\Delta\lambda < 5$ nm is effective under condition that $\Delta\lambda$ indicates a wavelength resolution for separating a light having a wavelength λ from a light having a wavelength $(\lambda+\Delta\lambda)$.